

## **REMARKS**

### **1. Summary of Office Action**

In the Office Action mailed October 1, 2009, the Examiner rejected Claims 1-2 under 35 U.S.C. § 103(a) as being allegedly obvious over Doke (US Patent No. 5,315,830) in view of Ghoshal (US Patent No. 6,474,074), rejected Claims 3-7 under 35 U.S.C. § 103(a) as being allegedly obvious over Doke in view of Pokhama (US Patent No. 6,415,612), and rejected Claims 8-9 under 35 U.S.C. § 103(a) as being allegedly obvious over Doke in view of Pokhama, and further in view of Chang (US Patent No. 6,474,407). The Examiner also objected to informalities with Claim 3.

### **2. Status of Claims**

Currently pending are Claims 1-9 of which Claims 1 and 3 are independent, and the remainder of the claims are dependent. Claims 1-3 and 7 are presently amended. Applicant submits that no new subject matter has been added.

### **3. Response to the Objections**

The Examiner objected to the terms "the exterior" and "the interior" in Claim 3 as having insufficient antecedent basis. Applicant herein amends Claim 3 to address the Examiner's objection.

### **4. Response to the Rejections under 35 U.S.C. § 103(a)**

The present application is directed to a thermal exchange device that is made to be more compact so as to reduce the space required by the device. To achieve a compact cooling unit that is still effective, a pair of housing walls with fans that are offset from each other is designed around the unit. One housing wall is positioned on the

upper side of the thermal electric cooling unit, the other housing wall on the lower side. Presently amended Claim 1 recites, "a first heat pipe ... extends laterally ... to an exterior of the housing; a second heat pipe ... extends laterally ... to an interior of the housing; ... a plurality of fins formed on the...heat pipes," similarly as Claim 3. In summary, the positioning of the two laterally extending heat pipes to either the exterior of the housing or the interior of the housing causes the fans to be offset, as the fans are above and below the extended portion of each heat pipe, effectively reducing the space required by the heat exchanger without compromising effectiveness.

#### **A. Claims 1-9 are Allowable Over the Cited References**

The Examiner rejected Claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Doke (US Patent No. 5,315,830) in view of Ghoshal (US Patent No. 6,474,074). The Examiner also rejected Claims 3-7 under 35 U.S.C. § 103(a) as being allegedly obvious over Doke in view of Pokharna (US Patent No. 6,415,612), and rejected Claims 8-9 under 35 U.S.C. § 103(a) as being allegedly obvious over Doke in view of Pokharna, and further in view of Chang (US Patent No. 6,474,407). Applicant respectfully submits that Claims 1-9 are allowable over the cited references, for at least the reason that none of the cited references discloses "a first heat pipe ... extends laterally ... to an exterior of the housing; a second heat pipe ... extends laterally ... to an interior of the housing" as recited in independent Claims 1 and 3.

The thermoelectric unit in Doke has a hot sink, a cold sink, electric motor, rotating shaft, and propellers to assist in the circulation of air to improve the efficiency of the cold sink and the hot sink. (Abstract). The unit in Doke does not disclose heat pipes. More specifically, Doke does not disclose "a first heat pipe ... extends laterally... to an exterior of the housing; a second heat pipe ... extends laterally ... to an interior of the housing."

For Claims 1-2, the Examiner concedes in the Office Action that Doke fails to disclose heat pipes, but cites Ghoshal, alleging it would have been obvious to one of ordinary skill in the art to merely provide a plurality of heat pipes extending from a side of the plate beyond the side, with a plurality of fins formed on the heat pipes. (Office Action, p. 2-3). Ghoshal does have heat pipes; however, the heat pipes in Ghoshal are not configured as recited in Claim 1. The Office cited Pokharna for Claims 3-7. However, Pokharna does not make up for the deficiencies of Doke and Ghoshal. Pokharna was cited as teaching a first heat pipe 22 positioned within a first plate and a second heat pipe 23 positioned within a second plate and extending from the side. (Office Action, p. 5). However, Pokharna does not describe a heat pipe within a first plate extending to an exterior of the housing, and another heat pipe within a second plate extending to an interior of the housing, wherein both the first plate and the second plate are attached to the thermal electric cooling unit.

Chang was cited for teaching a high density fin stack. Chang, however, does not teach heat pipes, let alone the configuration of the heat pipes as recited in Claims 1 and 3, and does not cure the deficiencies of the references discussed above.

#### **B. The Rejection is not Based on A Rational Basis**

To properly support rejection under 35 U.S.C. 103, the Office must provide articulated reasoning with rational underpinnings as detailed in the MPEP at 2141 (III). The Office has not provided articulated reasoning with some rational underpinning why Doke in light of Ghoshal, Pokharna, or Chang makes obvious the compact configuration described in the claims.

Doke is missing more than mere heat pipes. Doke is not concerned with providing a compact unit. The fans in Doke are shown to be in line with each other as well as in line with the items in between the fans, such as the electric unit, the hot sink,

and the cold sink. There is no mention of a configuration that creates an offset within this lineup of components to provide a compact unit. The heat exchanger shown in Figure 7B in Ghoshal is not designed for compactness either. Ghoshal does not show a housing made more compact by laterally extending heat pipes extending in opposite directions from a thermal exchange unit within the housing, creating an offset. Instead, Ghoshal comprises a series of heat pipes attached at one end to a chip packet, and at another to a heat sink. There is not an attempt in Ghoshal to compact this linear arrangement. Pokharna is also not concerned with providing a more compact heat exchanger. Instead, Pokharna is concerned with providing a second cooling mechanism for a laptop. The laptop has a traditional, first cooling mechanism. An additional second cooling mechanism is provided by a thermoelectric cooler in the laptop docking station. The second cooling mechanism is connected via a thermal port on the laptop. This second cooling mechanism does have heat pipes arranged to extend laterally to an exterior of a housing and an interior of a housing to create a more compact cooling system within the housing. Instead, in Pokharna, the heat pipes serve to connect the two heat exchangers. Chang also fails to describe a compact configuration for a thermoelectric cooling unit.

Objectively, one faced with the teachings of Doke, Ghoshal, Pokharna, and Chang would have no logical reason to make Doke more compact by creating the heat pipe configuration recited in the claims. Because the proposed combinations would not logically lead to the invention of Claims 1 and 3, *prima facie* obviousness of Claims 1 and 3 over Doke, Ghoshal, and Pokharna does not exist.

Applicant submits that one of ordinary skill in the art would not have used the heat pipes described in Ghoshal or in Pokharna with the device taught by Doke for the purpose of reducing the size of the thermal exchange device.

In light of the discussions above, Applicant submits that independent Claims 1 and 3 are in condition for allowance. Further, Applicant also submits that Claims 2 and 4-9 are also allowable by virtue of their ultimate dependency from Claims 1 or 3.

**5. Conclusion**

Applicant submits that the application is in good and proper form for allowance and respectfully requests the Examiner to pass this application to issue. Because the independent Claims 1 and 3 are allowable, the dependent claims are allowable for the same reasons.

Respectfully submitted,

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